VOLUME 2 - NO. 8 NOVEMBER 1994

The Low Band Monitor

November - Circuit

The editor got fooled again by the CQWWSSB Contest. After 30 years as an amateur I should know better, but I really thought that SSB weekend would yield something interesting - wrong again!

- The liars net on 3.830 mz after the test had a "high" 160 meter country total of 34 by one of the East Coast Multi-Multi's - ouch!
- **AA6TT** operating single band with one of the finest 160 meter four-squares in the U.S. managed 24 countries. Bill said that his 30 minutes of calling **4U49UN**, in Zone 5, pretty well says it all.
- **W6RJ** advises that his short-path European count on 80 meters was down by 40 percent this year.
- The editor could not even copy **N2RM. W3LPL, K3LR** and other beacons on 160 meters this year.

Conditions stayed bad for almost two weeks after the October contest with the 13th of November being the first good propagation day of this month.

The editor will not waste your time this year with a lot of spots from this dreadful period - let's just focus on some of the more positive developments. Conditions are definitely improving.

Positive Developments

- Received a note from **K0IJL** of Minnesota. He is new on 160 meters and on November 15 he was tuning the band and with solid Q5 signals he worked:

F5IN - IV3PRK - SP5GRM - F5LGE
DJ4SO - ON4ACG - G3PQA - G3BDQ

This entire sequence happened between 0552 - 0635 UTC and was very dramatic. Be sure to mark November 15 as a special propagation day this year!

- Eric, **K0KE** of Colorado started working longpath on 80 meters around the middle of the month. The best morning so far has been on November 19, with **OH7UE, OH1TX** and **SM5SB** being well over S9.
- Pete, **W0CM** of Kansas worked a booming **5W1MM** on 160 meters at his sunrise on November 22. This Western Samoan station has been audible most mornings.
- **SM5EDX** is working Colorado stations (**N2IC/0 and K0GU**) at our sunset on November 25!

If conditions can just stay stable for a few more days the CQWWCW could be a windfall for us all!

In This Issue

- The receiving loop antenna article by Merv, **K9FD** is worthy of your attention. Merv's secret is to use the large center conductor coax. His low band credentials are in order!
- My recent power line noise problem is reviewed. They let me out of the strait jacket now and I should be able to use utensils again soon.
- The awards program would indicate that overall band conditions are better than last year.
- Doc, **KD7SO**, researched the 40 meter needs of Western U.S. DXers and describes their various lists.
- There is a very interesting letter from Jeff, **K1ZM**, who gives us some insight about operating from the East Coast.

Quick - hand me my strait jacket!

Low Band DX News

• SYRIA- YK0A IS ON THE AIR NOW

Station YK0A will be active on all bands between November 23 and November 30. This operation will be manned by WA2TMP, K3NA, K6ANP, N6TV, NW6P, W6OAT, W6OTC and W0YK. They will also be active in the CQWW Test and will emphasize the low bands. QSL's to W6OAT CBA.
TNX: W0CP

• TONGA TO BE ACTIVE AGAIN

A35RK will again be activated by Paul, KK6H, from November 24, 1994 through February 7, 1995. He plans to be on for the CQWWCW, ARRL 160 CW, and CQWW 160 CW contests. QSL with to KK6H CBA.
TNX: NI6T

• PORTABLE MAST PRODUCT INTRODUCED

The Portaple™ is a lightweight 5'8" telescoping mast that can be extended to 26' in seconds. This 8.5 pound polished aluminum mast uses seven special locking sections and is ideal for DXpedition use on the 40 meter band. Contact: *New Wave Antennas*, 3320 S. Knox Court, Englewood, CO 80110. (303) 761-1458 for additional details.
TNX: KY0A

• DAYTON HAMVENTION IN MAY FOR 1996

This coming years Hamvention™ will be held on the traditional April dates, April 28, 29 and 30 of 1995. A major scheduling change for 1996 was announced with May 17, 18 and 19 of 1996 selected so that better weather could be enjoyed by the 35,000 attendees.
TNX: KB8KE

• SOUTH GEORGIA TEA BAG DRIVE

Al Hernandez, WA3YVN, advises that many low band enthusiasts still need to send their tea bags to his Florida address to support their 160 meter activity. He says that the group already has enough *Tetley* and *Lipton* brand teas and would like more *Brinings* Breakfast Tea and *Bigelow*. This group plans to activate South Georgia in early January of 1995. Contact: SGI DXpeditions, P.O. Box 2235, Melbourne, FL 32902.
TNX: WA3YVN

• NAMIBIA CQWWSSB LOW BAND ACTIVITY

The V59T operation was manned by WA0PUJ, AH9B, N0AFW, N9NS, NH6UY and V51GB as a Multi-Single. They set an all-time record in this class for an African station that was on the continent with over 5,200 QSO's. The low bands yielded 3-160 meter QSO's, 41-80 meter QSO's and 95-40 meter QSO's. The three 160 meter QSO's were with 9J2GA, A22MN and V51CM. The eight U.S. 80 meter stations worked in the contest were: AA4DO, AB4RU, K2ZB, K4IYG, N2RM, NK7U, W5KFT and W9ZRX.
TNX: WA0PUJ

• COMTEK FOUR-SQUARE ANNOUNCEMENT

Comtek Systems announces recent updates have been made to their switch box products and that early ACB-4 owners can obtain Capacitor Modification Kits by contacting *Comtek Systems*: P.O. Box 470565, Charlotte, NC 28247. (704) 542-4808 FAX: (704) 542-9652. The mod yields better F/B performance.
TNX: KF4HK

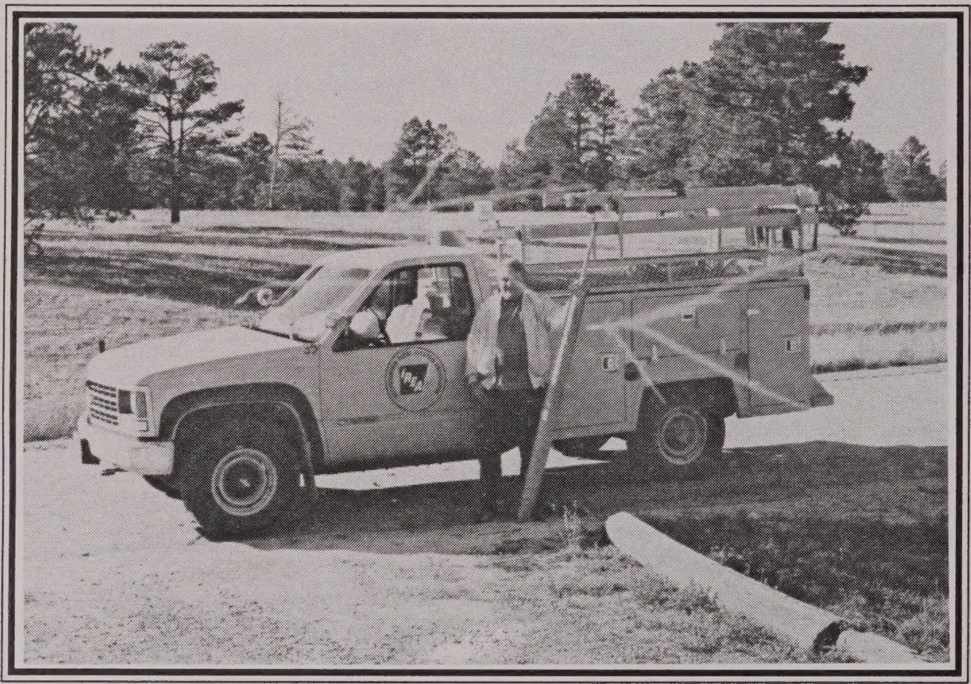
Lance Johnson - Editor

Power Line Noise Hunting

One Man's Experience - by K0CS

Editor's Note: Power line noise is one of the low band enthusiasts worst enemies. After living in rural Elbert County, Colorado for seven years noise free, K0CS encountered power line noise of the first order. We review the noise track down experience that I had recently with the IREA, the Intermountain Rural Electric Association of Sedalia, Colorado.

Initial Discovery - My power line noise problem started during the month of August in 1994. I noticed that the noise condition occurred when the wind was blowing at a slow steady speed and would sometimes go away when the winds were gusting. When the noise was in it's worst condition the 160 meter band was unusable and the intensity was even worse on the 80 meter band. The most distressing thing about it was it was intermittent. Numerous times I would leave my operating position with my Sony portable receiver in hand hoping to track it down, only to have the noise go away as I was walking out the door.



The local IREA Substation Technician, Gerald Fedders, who tracked down an Elbert County noise source. He is holding the telescoping probe used to tap the service lines. Don't try this at home kids! Leave the actual search to a professional!

During September the noise seemed to appear with more frequency and was even quite noticeable on my telephone line. The pulses were also visible on the LED's (7-S units) of my 2 meter transceiver. In early October a true sense of urgency developed when I found out that I could induce the noise by transmitting on 160 or 80 meters. Before the transmission, no noise, after the transmission I would have about 50 db for about 5 - 10 seconds on the vertically polarized transmit antennas and S-7 noise on the Beverage receiving antennas. This sure set up some very tentative low band DX contacts when people were saying, "he's calling you CS". Needless to say, my reputation as a mediocre low band operator was going down the drain.

Clean Up Your Act - Before approaching the local power company it was decided that all potential local sources of noise would be checked to make sure that everything within my control was in order. Beverage antenna relays, transmit antenna connectors, guy wires, appliances and metal fences were all inspected for obvious faults.

While monitoring the Sony portable, no changes in noise level were observed while these changes were made. For a moment one day I thought the source of the problem was my neighbor's freezer thermostat, located in his garage - no luck. Another strategy was to shake power line guy wires that were in the direction (Northwest) that the noise appeared to be coming from, based on Beverage antenna observations - again no luck.

One complete set of tower guys was redone, two Beverage switch boxes rebuilt, about a thousand feet of my neighbor's old rusty barbed wire fence removed and some questionable overhead florescent lighting was replaced. None of these changes had any effect on the noise problem, but they did put me in a posture where I knew quite a bit more about my own environment and gave me the necessary confidence to make the call to the IREA.

Calling the Power Company - Like many other Colorado organizations, the Intermountain Rural Electric Association, IREA, has a busy agenda. This part of Colorado has experienced significant customer growth. The local office in Sedalia, Colorado services the regions most dynamic growth area in the state, Douglas County.

My strategy was to request an inspection in early November so that I might see a technician before Thanksgiving and the CQWWDX Contest.

I was delighted when one of their Substation Technicians, Gerald Fedders, called me to set up a visit only three working days after my initial call inquiry.

My biggest concern was that the noise condition would not be evident during the visit. If the noise was not present I would probably be considered "eccentric" and filed away under "nuisance complaints".

Tracking Down the Problem - The IREA truck was at my driveway and I was delighted to hear what sounded like a running chain saw coming from the cab of the truck. Mr. Fedders had verification with the truck's AM radio that there was noise in the immediate area.

After exchanging the usual greetings, I grabbed the Sony portable and the hunt was on. At this stage I had a number of pieces of information to add to the puzzle:

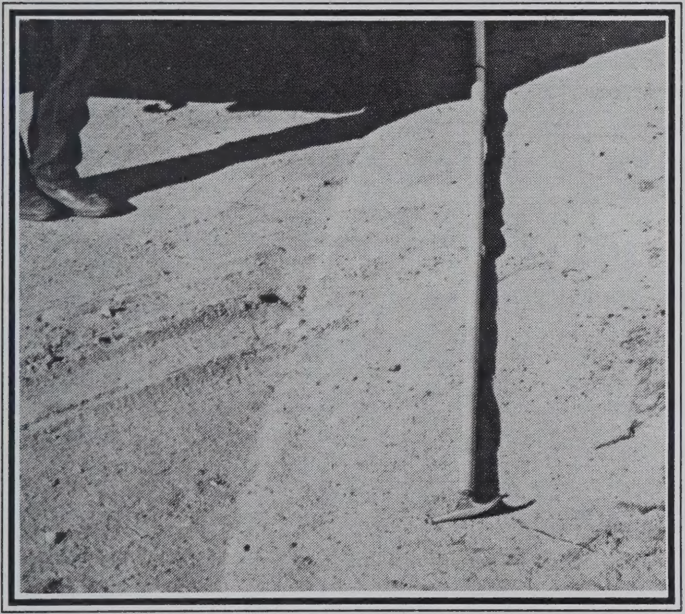
1. The noise was coming from the Northwest. This was based on Beverage antenna readings that were 1-S unit stronger to the Northwest.

2. The noise level seemed to be louder in the 3.665 mz. region of the 80 meter band.

3. All service poles in my immediate area and on my neighbor's property were previously "tested" using traditional methods. While listening on the radio, one person shakes the poles guy wire, attempting to induce a change in the noise pattern. All of the local poles (on my property) appeared to be clean.

The Beverage Lies - Based on my "Northwest Territory" Beverage antenna observations, Mr. Fedders and I checked out about six poles in that direction. The technique he used was interesting. A telescoping 30' long fiberglass pole with a metal "T" shaped probe is used to touch the service line hardware. The voltage on the top wire is 7,200 volts. Surprisingly, no change was observed in the noise as various service pole hardware in the Northwest direction was tapped with the probe.

At this point the service tap for my electrical service (and neighbors) was disconnected and to my relief, no change in the noise was observed. After all the previous personal inspection done by my neighbor and myself, I felt relieved that we were not the cause.



This is the probe used to inspect power line hardware. Fiber glass construction that telescopes 25 - 30 feet. Let the professionals perform this inspection!

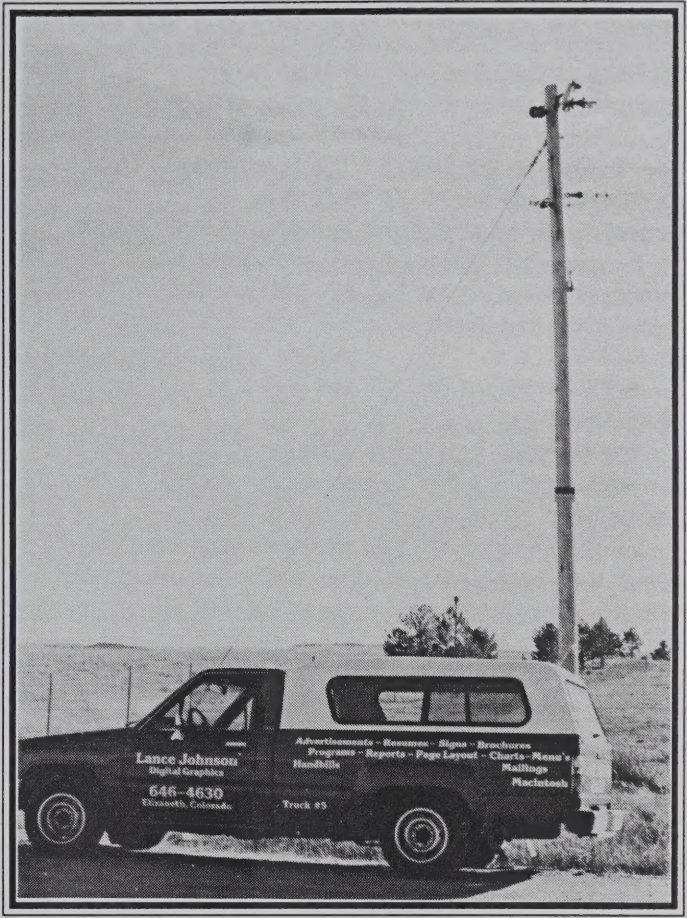
Although we had not yet located the noise source we had discovered a couple of new pieces of information. The noise diminished as we went farther North and seemed to increase as we went East.

While riding East, about 200 yards from our original starting point, we came to a service pole and immediately noticed a small but noticeable increase in the noise level. I walked to the pole and shook the guy wire. Amazingly, the noise went away completely - the noise was gone!

Mr. Fedders, the Substation Technician, advised me that this was a special pole, a meeting point for two service lines. A switch on the pole that selects phasing, was the apparent culprit.

Now in ecstasy, I wasn't particularly interested in the precise technical details. IREA will schedule a service crew in a week or so to formally address the problem. I am guessing that some hardware needs to be tightened or replaced.

Mr. Fedders and I returned to my hamshack and checked the ambient noise level. What was once, a few minutes before, a steady S-7 was now a nice quiet S-2 on all of my Beverage antennas. I can now hear WØZV work into Europe on 160 meters.



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The offending service pole. Shaking the guy wire stopped the noise temporarily. A small sign warns of a phase shift on this pole. IREA will service at a later date.

Conclusion - The IREA Substation Supervisor, Gerald Fedders, spent over an hour with me patiently checking the hardware on at least a dozen power poles. This is the real key to solving a noise complaint - having a power company representative who will work with you.

No fancy receiving equipment was used in this search - only the probe and the AM radio in the IREA service truck.

The false conclusion made with the directional Beverage antenna was based on the 1-S unit stronger reading in the Northwest direction as compared to six other directions. It is obvious that this particular noise source was radiating energy into other power lines and guy wires that were re-radiating the energy in a manner that made one think that the source was in a different area.

Once you begin your search, maintain an open mind and let the observations made in the field direct your search, not some preconceived theory. Any time spent studying the power line in question, before the representatives visit, is probably time well spent.

Familiarize yourself with the environment, but don't get too ambitious. Your preliminary observations can be helpful, but leave the actual noise pursuit process to the power company professionals. A noise level of 7-S units can ruin your day. Coming in contact with 7,200 volts can ruin your life.

Western Edition - 40 Meter Need List

What Is Really Needed on 40 Meters West of the Mississippi - by KD7SO

Editor's Note: The 40 meter band has kept many low band DXers active in recent months. During the next few years of lower solar activity it will be possible for more enthusiasts to pursue the upper strata country totals on this band as more DX stations matriculate to 40 meters. In this article, KD7SO explores the needs of the top Western North American 40 meter DXers.

Background - Like most all time countries worked lists, the 40 meter 300-plus list has an East coast bias. The ARRL DXCC Yearbook documents the 300 plus 40 meter DXCC with: W1 -12, W2 - 4, W3 - 7, W4 - 12, W8 - 4, and W9 - 2. The Western Districts show: W5 - 1, W6 - 1, W7 - 3, and W0 -2 listed at the 300 plus country level.

The Survey - As a serious 40 meter DXer from the West, I was curious about what countries were needed by the more accomplished 40 meter DXers on the West coast. This fall I communicated with most of the people on the list and was able to identify their most needed countries on 40 meters. Many telephone calls, letters and FAX's were required to obtain this information.

From the survey it looks like the rarest countries needed by everyone are 3V, 5A, FR(G) and SV(A). Activity is planned from FR(G) in February of 1994 so this may bring the rarest list down to three.

At the next level of rarity are 7O, E3, ST0 and YI. One of the few 7O contacts made was on 40 meter longpath in the SSB mode!

Next in line are 4J, A5, and TT which were worked by just a few of these accomplished operators. Initial reports indicate that few West coast 40 meter enthusiasts worked the recent TT stations on 40 meters.

Recent Achievements - This survey was comprised of operators who have 300 or more countries confirmed on 40 meters. One person below 300, however, should be noted, K7JVE, who has worked 268 countries on 40 meters in only two years using a wire vertical. Bill's achievement gives you an idea what can be done on this band with a modest station and lots of dedication.

Thanks to everyone who contributed to this survey! A lot of great stories and insights were received from this elite group.

CALL	40 METER COUNTRIES NEEDED - *COMPILED BY KD7SO*
VE7AHA	3A-3B6-3V-4J1-5A-5U-5X-5Z-7O-8Q-9X-A5-D6-E3-FR(G)-FR(T)-HV-ST-ST0-SV(A)-SV5-T5-TJ-TN-TT-TY-TZ-VP8(S)-YA-YI
WA7BPI	3V-5A-9U-9X-A5-D6-E3-FR(G)-FR(T)-HV-ST-ST0-SV(A)-TT-TY-VK(H)-YK-ZD7
W6KUT	1A0-3A-3B6-3V-4J1-5A-7O-7X-9X-D2-E3-EI-ET-FR(G)-JX-JY-OD-PY(T)-ST0-SV(A)-TA-TL-TN-TT-VK(M)-YI-YK-ZD7-ZK3-ZS8
N6ND	3A-3V-4J1-5A-5N-7O-A5-E3-EP-FR(G)-HV-JX-KH5(K)-ST-ST0-SV(A)-VK(M)-VK(W)-VP8(G)-YI-YK-ZC4-ZL9-ZS8
N0RR	3V-5A-7O-A5-E3-EP-FR(G)-S7-ST-SV(A)-T5-TT-VU7-XW-XZ-YI-YK-ZS8
KD7SO	1A0-3V-4J1-5A-7O-9U-A5-E3-EP-FR(G)-FR(T)-JX-JY-S0-ST0-SV(A)-SV9-T5-TT-TY-VK(H)-YI
W6YA	3A-3V-4J1-5A-7O-CY(S)-FR(G)-ST0-SV(A)-YI

Lance's Top Ten Reasons Why....

You may be taking Low Band DXing too seriously!

10. You sent your son to Cal Poly for one reason - to study phased vertical array theory.
9. You still use your first wife's new husband as a guest operator in the CQ 160 Test.
8. You plan your vacation around the 28 day solar rotation.
7. You missed the alimony payment to your second wife to pay for your *Yaesu* FT-1000.
6. You bought another 40 acres to compare stranded vs. solid wire Beverage antennas.
5. *Eimac* sends you two boxes of Harry & David pears at Christmas.
4. *Cushcraft* and *Hy-Gain* refuse your Beta Test offer for a 160 meter yagi.
3. When asked about O.J. you respond, "Worked it on 160 in 1984 - operator was Martti".
2. You call WWV to argue about their latest "K" Index parameter.
1. You are currently bidding on your second *Voice of America* installation.

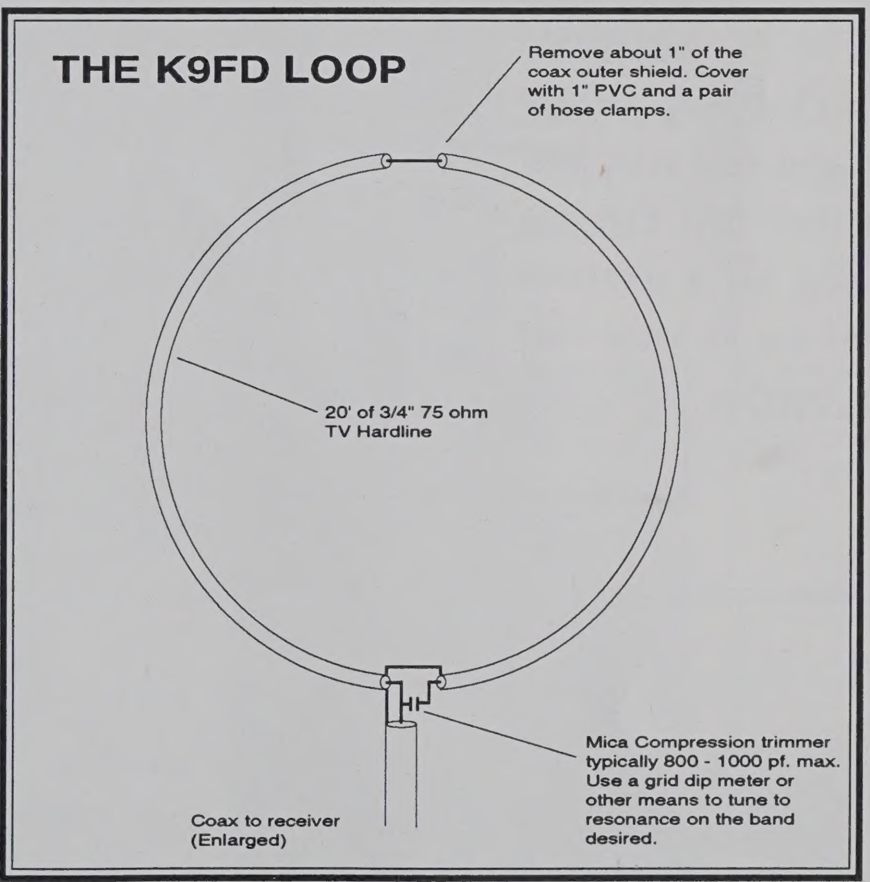
The K9FD Receiving Loop

The Answer To Suburban DXing On the Low Bands - by K9FD

Editor's note: Merv Schweigert, K9FD, has been working just about everything on the 40, 80 and 160 meter bands this season. In this article he shares some of his experiences with receiving antennas. If you live on a typical suburban lot you might want to read this article carefully as you won't need forty acres to use this antenna.

A few months ago I lost access to my farm neighbor's corn field that I used to utilize for Beverage antennas in the winter months. In the past I would erect a few terminated Beverage antennas towards the east and south to enhance my receiving capability on the low frequency bands. After losing this superior receiving capability, I set out to find some kind of replacement system that would again allow me to be viable on the low bands.

Early Receiving Antenna Trials - My first attempt at improved reception was a low dipole for 160 meters. This antenna was installed at the 8' level. After trying it for a few months, I abandoned it as copy was typically better on my transmit antenna, an inverted L at 75'. The search for Q5 copy continued.


THE K9FD LOOP
Remove about 1" of the coax outer shield. Cover with 1" PVC and a pair of hose clamps.
20' of 3/4" 75 ohm TV Hardline
Mica Compression trimmer typically 800 - 1000 pf. max. Use a grid dip meter or other means to tune to resonance on the band desired.
Coax to receiver (Enlarged)

My next receiving antenna project was a 2 wire Beverage that is described in the Beverage Antenna Handbook, written by Victor Misek, W1WCR. This antenna is 238' long with the wires about 6' off the ground and utilizes a tuning network that changes the phase angle to null the noise off the rear. This antenna worked fairly well, to the south, but because of some power line noise to the north that always seemed to surface as I was trying to make a DX contact this system was also set aside.

The third attempt at improving my receiving capability was to try a receiving loop. My information said that the loop has a terrific null off of the side and if shielded can be quite effective. The first receiving loop I tried was made with RG-59 coax, as recommended and it did work rather well. You could rotate the loop and null the noise down to zero and still hear signals. The problem that I encountered with loop #1 was that the signal strength was low and a preamp would be required to correct this condition. When you run a kilowatt in close proximity to a loop you can imagine what will happen to the preamp unless switching considerations are taken. This switching concept is certainly possible, but a more elegant solution with less complexity was tried.

The next loop I constructed was similar to the RG-59 loop except that I used 3/4" 75 ohm TV hardline in the construction. This cable has a much larger center conductor. I am very much impressed with the results. The signal gain is much better than the RG-59 loop and no preamp is required. This loop works well on nulling powerline noise and can also help you null out the noise produced by approaching thunder storms.

Constructing the Loop - This receiving loop is constructed from a 20' long length if 3/4" diameter 75 ohm cable TV hardline. Form the length into a circle and using a pipe cutter, cut through the shield at the top center of the loop in two places about 1" apart. Then, using a hacksaw, carefully split the 1" section from the hardline and peel it off. To strengthen this gap, place a 6" long piece of (split) 1" PVC pipe over the gap and secure it to the cable using a couple of hose clamps.

You can house the trimmer capacitor in either a metal or plastic enclosure. Use a grid dip meter to tune the loop for resonance on the band of your choice. I used a 400 pf. fixed mica capacitor with a 400 pf. trimmer in parallel for the system at K9FD.

Conclusion - In using this loop I sometimes see some directive properties on DX signals. Some publications say that the loop is omnidirectional to sky wave and only has directional properties to local noise. I have no answer to this as it is not apparent on every DX signal. What I do know is that the use of the 3/4" diameter 75 ohm cable TV hardline for constructing the loop receiving antenna makes a huge difference.

You will also find that the hardline loop will require less of a support structure. When placing your loop in your yard try to locate it as far away from your transmit antenna and other structures as much as possible.

This antenna is not a substitute for an 80 acre Beverage farm, but if you are on a small lot and are plagued by power line or other man made noise this receiving loop will improve your receiving capability on the low frequency bands. You won't work all of the DX, but you will get a much bigger share than before.

POTPOURRI - POTPOURRI - POTPOURRI

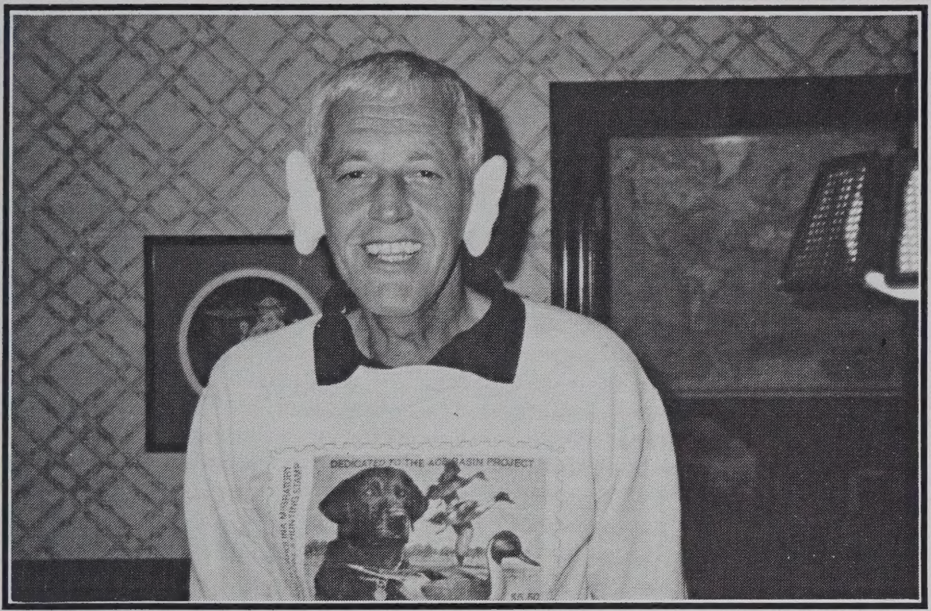
RADIO ANYONE- This is the famous Radio Ridge location utilized by N6DX and other famous DXers. There are too many antennas to mention. The Pacific Ocean is in the background. Longpath anyone?

SM5EDX - This is the 160 meter antenna used by Jan-Erik to give most entry level 160 meter DXers their first European contact. This vertical has a resonance around 2.0 mz. and can be heard most evenings in North America.

N2KK - This is the rugged Tehachapi Mountain terrain near station N2KK. A Four Square vertical array for 80 meters with elevated radials helps compliment the view.

POTPOURRI - POTPOURRI

RECENT EXPERIMENTS IN RECEIVING ENHANCEMENT...



EAR TRANSPLANTS - Jack, N4JJ, shows off his new ears that have contributed significantly to his low band success. His plastic surgeon offers special discounts for Honor Roll Members and group rates at DX Club meetings.

AND THE LATEST IN ASP (ANALOG SIGNAL PROCESSING) FROM EUROPE...

HE SENT 569 - Jan, SM5EDX, has a secret weapon for copying weak low band signals. Thumper has been trained to copy CW (up to 18 wpm) and is shown here tapping out a wispy 160 meter signal report from Pete, W0CM, of Kansas.

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LETTERS - LETTERS - LETTERS - LETTERS - LETTERS - LETTERS

Lance:

After an interesting July, August and September were pretty boring here in California, except for FR5HG/E on 40 meters in September. The 80 meter band came alive in mid October on the Left Coast. I can tell you that - with our PacketCluster connection to the Right Coast - it gets pretty damned frustrating watching all those low band openings with absolutely nothing happening in California, then or three hours later. There have been a couple of short openings on 160 meters. I listened one Saturday night and heard two of the regular SM's and OZ1BTE; the OZ might have been a new one. "Might-have-been" is the operant term, because as a general rule, NI6T - the Jackal - does not get through when the lions are eating, and the lions are definitely around on a Saturday night. I tried two furtive calls and got emphatic dihdihdahdahdiddids for my pains, as did KK6H. A few nights ago, SM6CPY was ragchewing with a W7 in Seattle, and was good copy here, but unavailable to call. On October 23, the Pacific came alive on 160 meters, with 5W1GC working a lot of people. Cliff and V85AA were both quite loud at the sunrise bump, but XX9TSX was not heard during his QSY to 160 meters. UN7F was heard on 80 meters along with the JA/3B8 DXpedition. My 80 meter tally this season is 42 and I have missed quite a few including T30BH and XU7VK. XU7VK seems to go QRT before the Left Coast sunrise but has been loud here at times. One noticeable factor this season is the greater number of refugees from the higher bands. Many of the new guys are well equipped and create 20 meter style pileups on everything. Last night I spent an hour trying to work 9Y4SF on 75 meters. Like, big deal? Trinidad? Sinclair either could not or did not work anyone on the Left Coast through that Eastern Wall. That kind of pileup is not much fun!

Another factor these past weeks has been that US Navy RTTY-like station in the Caribbean (FCC Livermore says Dominican Republic - ARRL says Puerto Rico) that has perched in the 75 meter window, rendering the middle of that small segment unusable. I have been in communication with Larry Price at the ARRL and my Division Director and Vice Director about this problem. The short story is that the FCC says that it's a government station, under the control of the NTIA, but the NTIA denies the existence of the station, which is presumed to be a part of the Haiti operation. The ARRL is supposedly working with the Beltway to get it identified and moved. Mr. Price says that no one knows yet whether the station is there because of some great plan or because some inexperienced operator thought it was a nifty frequency and fired up.

I was amazed by K9FD's performance on 40 meters and am sure he has reached 100 on 80 meters by now. I was equally amazed to see your tired reference to the Midwest "black hole". You imply that Merv's achievement was all the more impressive because of the "black hole". Cannot one take the same facts and argue the opposite - that 154 countries on 40 meters in 24 days in September with no contests suggests that there is not a propagation handicap? We here on the Left Coast watch midwestern guys consistently posting lowband stuff we either cannot hear or cannot work through them. I cannot be convinced that the 40 db. over S9 reports given to barefoot 8's and 9's by Caribbean stations on 75 meters - stations that are S3 here and which almost never work us until those stations are worked out - denote any kind of disadvantage. Let's see when your first West Coast award winners check in.

Garry, NI6T

Garry:

I am answering your letter on November 7 and can simply say that except for a few brief bursts of propagation in September and October, the low bands have been very unproductive. The CQWWSSB was hurt by a severe storm and we have been into double digit Boulder "A" Indices ever since. I enjoy listening to the pileups for common lowband DX that you reference. They provide us with some great entertainment. These pileups sure beat the dead air I heard all weekend in the CQWWSSB on the 160 meter band. If it wasn't for N7DD there wasn't anything on at times! It was rare for me to hear W3LPL, K3LR, and K1ZM this year!

The RTTY activity on 3.795 didn't surprise me, but you have to wonder - why didn't the operator choose the Geritol Net? The "black hole" reference to K9FD is appropriate, as Merv has been one of the operators at Lew Gordon's (K4VX/0) contest station in Hannibal, Missouri, where the term originated. From Merv's location you typically nail Southern Europe, West Africa, the Caribbean and South America quickly. Then the "black hole" reality sets in - puny Northern Europe, no long path at all and spotty openings to Asia and the Pacific. You hit the wall at around eighty countries. From Zero District the time spent working the last twenty countries can easily be two to three times more than the time spent working the first eighty, simply because no dominant paths exist. All California stations really suffer when trying to work Southern Europe and Africa, which certainly is a major handicap. You certainly recover nicely with your "slam dunk" paths to the Pacific and Asia, that are further enhanced by your U.S. competition typically being in sunlight. Your real edge over the "black hole" operators is in the long path/skew path propagation potential you enjoy to Northern Europe and Asia. This doesn't exist when you are along the Mississippi River.

If I was betting I would not have picked K9FD on the 80 meter band. I would have picked someone in the 4th District. As you know most 1st District mobiles are working DXCC on 80 meters while commuting to work and are simply bored with the lack of a challenge.

By the way, the second 80 Meter award went to Bob Ferraro, W6RJ. The fourth 80 Meter Award went to Fred Capossela, K6SSS. Both of these veteran DXers live in California.

Lance:

Lately, the 160 meter band has been far better than recent years. This can best be defined by what I can now hear and work at sunset. In the last two years, anyone South of Boston and Maine could only "listen" to VE1ZZ, W1ZE and KA1PE spot and work DX from Europe at sunset. Tape recordings of selected signals , eg. 9K2ZZ at sunset revealed about 18 db of attenuation between KA1PE and my QTH which is 75 miles North of New York City. Signals that I could barely tell were there were 579 at KA1PE and 589/599 at VE1ZZ. This year I am not only hearing Europe 1/2 hour before Sunset on some days. I am able to work it almost as soon as I hear it. For example on 20 October I worked GW3YDX who was 579 at 2139Z. On that day, my sunset was at 2210Z. As sunset approaches, the first G's and GM's start poking through the noise about 2200Z and are workable for about 2 hours until they either go to bed or the absorption drops them into the noise here. Around 0300Z, on most nights, the EU operators are back in until around 0630Z when ZL2SQ shows up at his sunset. On very quiet geomagnetic days, the difference between an exceptional day vs. a normal day is easily identifiable.

On "hot days" the G stations never fade out completely, they hang in at reduced signal levels, around 559, and other signals can be worked nonstop from my sunset, right through EU sunrise. For these conditions to occur, the Boulder A/K Indices need to have been 3/0 or 2/0 for several days in a row. My readout on this season is that it is clearly improving here - no question about it. I am working 25-30 DX stations just fooling around every night and 1-3 at sunrise each morning going the other way. This level of improvement may not be enough to sustain good propagation levels on a regular basis into the Midwest. I doubt that it will, if it does, until the period from about the 3rd week in November through the 2nd week in January. If the sun is quiet during these 7 weeks of optimal 160 meter opportunity, for several days in a row, then I think that the Midwest will start enjoying 160 meters again. However, I do think that the 1994-1995 season is a transition year and that our best propagation on 160 meters will be during the following two seasons.

I've been playing around with some different 160 meter antennas out here for the last two weeks. Since 18 October, I have been using a pair of phased verticals with 1/4 wave spacing. Proper phasing of grounded radiators is not simple and can be greatly impacted by the values of the matching components required to achieve 50 ohms at the feedpoint connection. To clarify that statement somewhat, it is far easier to maintain 90 degree phasing of the currents when using insulated radiators with direct 50 ohm coax feed.

At my QTH, I was forced to use existing towers that were available which were grounded in concrete bases and the results, while acceptable to be sure, are not optimum - yet! I am seeing 12 db F/B in both Europe and ZL which are in the two main lobe patterns. I can work what I hear without too much difficulty - but the acid test is that I still trail W1ZE into Europe by at least an S unit. I would be very interested if any of your readers know the secret to phasing ground mounted radiators properly. I can tell you with absolute certainty that a simple electrical 1/4 wave delay line connected to a grid-dipped 1/4 wave transmission lines to each vertical is not perfect, although it does get you in the ballpark. Has anyone done this well and are the component values for two 160 meter grounded verticals known? Today I am putting down the final ground system under a third tower. This one will be oriented in such a way that when combined with one of the other two verticals already in use, I can derive pattern selection to 100/280 degrees in addition to the 40/220 current available to me. I have decided to try this because I notice that on S92SS, 5T5JC and ZS5LB that the 40 or 200 degree patterns are not quite right. The 40 degree pattern is slightly better to these stations than the 220, but not nearly the very clear difference that I see when switching on a target G or ZL station. The other night, for example, Harry, ZL2SQ observed over 2 S units throughout a 45 minute QSO that started out on CW and wound up as a 20 minute rag-chew on SSB at the peak period. This third tower is also grounded, so again I am looking for help from those who may have developed a similar system.

Perhaps an engineer with broadcast tower phasing experience would be able to design a circuit quite easily, but the average ham won't be able to do this without some help. I will stick with my existing 1/4 wave delay line until something better comes along. The problem that is occurring is that the phasing is being shifted away from 90 degrees optimum by the differing values of the vacuum capacitors that are being used to match the two verticals. What is most likely needed is a network in the middle (replacing the 1/4 wave delay line) that can get the phase back from what it currently is - to a proper shift of 90 degrees. In theory, the problem statement is easy - the challenge is in the execution.

Jeff, K1ZM

Jeff:

Your prediction about 160 meter propagation to the Midwest was right on. Except for the brief flourish in September and a few days before the CQWWSSB in October we have heard nothing interesting for over ten days. Our readers will appreciate your comments about relative hearing capabilities on the East Coast. Those of us in the Midwest think that all stations in the 1st District have a pipeline into Europe, but we have no concept about the subtleties of East Coast "top band" operation. Do you work the LZ stations first and then the YO's or is it better to warm up with a few dozen G's? Those of us with around six European 160 meter contacts a year would like to know!

Are any time share single family homes available (with an ocean view) in December near say, Calais, Maine? You would think that a couple of weeks at a location like that during "prime time" would fill a lot of gaps in the old "top band" countries list. I would work as a gardener or custodian for free if I could put up a single 160 meter vertical in Maine (I need France and Italy on 160 meters...) during December.

Lance:

The low band season got off to a good start in September here in Pennsylvania. The VK6's showed up almost every day on the longpath at sunset and the Europeans have been decent on good days. After last winter with it's 17 snow/sleet/freezing/rain storms, I decided to replace the rope guys on my 80/60 meter vertical. I really didn't trust the old ones and they were starting to look pretty ragged. I still need to put down a few more radials and work on the "receive only" dipole for 80/160 meters. I am going to try something a little bit different and will let you know the results. I would like to see where the Power Spots originated from such as an E, C, or W. This would help track propagation.

Stew, K3ND

Stew:

Like many of our readers I thought that the September low band openings were a true indicator for things to come on a consistent basis this fall. What really happened, except for a few days in October, was one of the worst low band propagation periods I have seen in years during the fall. The period from October 28 through November 10, as this is being written, was simply dreadful. When the amateur radio hobby gets bad, I escape to the garage and work on some old cars. This recent doldrums period permitted three oil and filter changes, two nice wax jobs and the installation of a glove compartment. Let us know if you have any success with the new 80/160 meter receiving antenna. Regarding the E, C, and W concept; conditions have been so bad during the past period I am literally going global to find any propagation. Rumor has it that the UA9's are starting to hear the UH8's on 80 meter short path - stay tuned!

Lance:

Here are my records for the *Low Band Monitor* 80 and 40 meter country awards. Most of the 80 meter contacts were made with the elevated ground plane described in my article in the June 1994 issue of QST. I am a little disappointed to see so much emphasis on being first to achieve the minimum requirements and so little attention to the participants who produced the largest totals at seasons end. I think that both achievements are worthy of praise. It also may be time to add a 160 meter 100 country award for 160 meters. During the last sunspot minimum, I worked 140 countries from Alabama in four months from mid December 1983 to mid April of 1994, so it is possible. I got off to a slow start this year following the loss of my wire antennas to a near miss by a tornado which had not quite touched down as it passed my QTH, knocking down over 30 trees on my 4 acres, including two 75 year old 100 footers (Oak and Beech), and ten 80 foot Poplars. The falling trees destroyed all 8 Beverages, my 110 foot high 80 meter dipole, the elevated radials for my 80 meter grond plane and my two element 40 meter Delta Loop. Two Poplars fell on the top of the guys for my 130 foot tower, stretching the guys and pulling the top over but not breaking anything! Thank God for preformed guy grips! I have seen two towers fall as a result of the guy wires pulling through the cable clamps. Have you considered some inducement for articles? Chod Harris - *DX Magazine* pays a nice incentive of $10.00 per page, or $20.00 per page if taken in the form of subscriptions. Also do you have incentives for referrals. I have spread the word to a number of low band enthusiasts. How about a one month subscription extension for each referral.

Tom, N4KG

Tom:

Congratulations on making the top five in both the 40 meter and 80 meter listings this year. Award statistics from last year will be used for analysis with this years results - stay tuned. The first year is always tough but we now have a framework for comparison. Antenna work is good exercise - but it's no fun after a tornado! A newsletter without one cent of advertising can hardly afford to pay anyone for articles or subscriber referrals.This would also be a nightmare to administer. The low band material I receive from our altruistic contributors may help them establish themselves for paid writing opportunities in the future. I am not seeing enough activity on 160 meters yet to merit an award. If enough interest is shown for a 160 meter seasonal countries worked award I will start one next year. At this time 160 meter contacts are so infrequent that it is probably wise to stay with the Worked All Continents concept that many people can acquire.

The Second Season - Month Three

N4KG, W6RJ, WB9GYU, K6SSS, W8UVZ, K8GG, K0CS, and KY0A Credentials

Seasonal Outlook - Based on early returns for the *Low Band Monitor* awards it looks like 94-95 is offering almost a month more of quality propagation when compared to the previous 93-94 season. Last season Al, W8AH claimed the 40 meter award in 72 operating days. Merv, K9FD claimed it this season in 24 days.

The 80 meter award also required 72 days last season. This season, it was captured in 45 operating days. Note that both seasons had W8AH and K9FD as double 40 and 80 meter winners.

The 160 meter band Worked All Continents Award took Charlie, KY0A, 63 operating days to capture in 93-94. Bill, W0ZV, nailed this one in a mere 17 days in the 94-95 season. Things are looking up!

160 Meters - Tim, WB9GYU, joins the top band group in the #4 position. This is a fine achievement from a Minnesota QTH. He caught JA1CGM on October 26th, a few minutes past his sunrise, to end his search. Good quality Europe and African contacts!

Steve, K0CS, claims #5 and thanks the group from PJ1B for the pre-contest QSO to finally work South America.

Charlie, KY0A, also worked PJ1B and takes the #6 position.

Notice the two week gap before the arrival of George, W8UVZ, of Battle Creek Special fame, who captured #7 position. The band has really been bad folks, until November 13.

Tom, N4KG, active on all bands from Alabama takes the #8 position by finally working JA1CGM on November 14.

Another Battle Creek Special principal, George, K8GG, checks in at #9 with G3PQA as his closing contact.

This award has simply not been trivial so far this year. As you know the CQWWSSB was no help, but a good CQWWCW weekend may turn it around.

The *Low Band Monitor* had 27 subscribers qualify for the 160 meter award last season. Lets try to push this number to 50 or more top band qualifiers this time.

80 Meters - Bob Ferrero, W6RJ, used the CQWWSSB contest as a vehicle to complete a very impressive, business like 100 countries on 80 meters for the #2 position.

Bob advises that his short path to Europe was down by about 40 percent in the contest, but he made up for the shortage with a batch of 7-UL7's, and 3-XX9's! He has about three inches in his contest log of continuous Zone 16-17-18 stations - amazing!

Tom, N4KG, used his innovative 80 meter antenna featured in QST to capture the #3 position. If you compare Tom's log to that of W6RJ, you would think that they are in different countries. This is a more impressive effort when you consider that Tom lost about half of his antennas last summer.

Another Californian, Fred, K6SSS, presented a beautiful laser printed #4 entry. Fred used a mini-Four Square on his 1/4 acre suburban lot to do the job. This was a very steady journeyman like effort, with only a dozen required contacts made during the CQWWSSB.

40 Meters - Tom, N4KG, Alabama's top DXer, completed the "triple" with a 40 meter submission. This is the second year in a row that Tom has made the list on all three bands. This is a very impressive achievement.

Conclusion - Plaques for the #1 position have been sent to all of our band winners for both seasons. We will run photos of these nice awards in a future issue. All participants receive a nice personalized certificate noting their position on the appropriate listing. The Boulder "A" Index graphics from 1993 give the certificate a unique quality.

These awards are fun and provide us all with a good barometer for low band propagation conditions on a worldwide basis and require no QSL's to qualify.

The November CQWWCW should provide many of our subscribers a chance to boost their totals - hope that you make it!

160 METER WORKED ALL CONTINENTS 1994-95

NO.	CALL	DATE	AFRICA	ASIA	EUROPE	N. AMER.	OCEANIA	S. AMER.
1	W0ZV	09-17-94	VQ9SS	4X4NJ	HB0/HB9NL	VE8HL	ZL2SQ	PT7BZ
2	K1ZM	09-18-94	S92SS	4X4NJ	SM5EDX	KA1PE	ZL2SQ	PP7JR
3	K9FD	09-29-94	D44BS	4X4NJ	R1FJL	AL7MX	VK2BJ	PY2BW
4	WB9GYU	10-26-94	S92SS	JA1CGM	JW5NM	XE2/AI7B	VK3OT	PT7BQ
5	K0CS	10-27-94	EA8PP	JA1HQT	CT1AOZ	W0ZV	5W1GC	WA3LRO/PJ4
6	KY0A	10-29-94	C56/G0MRF	JH0ZHQ	RZ6HW	VG3EJ	VK3OT	PJ1B
7	W8UVZ	11-13-94	Z21HS	JH1RES	SM5EDX	AL7MX	VK5BC	P40J
8	N4KG	11-14-94	DL3KUD/CT3	JA1CGM	CT1AOZ	CO1RH	VK3OT	8R1K
9	K8GG	11-15-94	S92SS	JH1RES	G3PQA	6D2X	VK5BC	PJ1B

80 METER WORKED 100 COUNTRIES 1994-95

NO.	CALL	DATE	COUNTRY	STATE	SUBMITTED	LATEST
1	K9FD	10-15-94	USA	ILLINOIS	104	104
2	W6RJ	10-29-94	USA	CALIFORNIA	110	110
3	N4KG	11-03-94	USA	ALABAMA	100	101
4	K6SSS	11-13-94	USA	CALIFORNIA	100	102

40 METER WORKED 150 COUNTRIES 1994-95

NO.	CALL	DATE	COUNTRY	STATE	SUBMITTED	LATEST
1	K9FD	09-24-94	USA	ILLINOIS	154	161
2	K0OD	10-07-94	USA	MISSOURI	151	151
3	N4KG	11-02-94	USA	ALABAMA	152	156

LOW BAND MONITOR POWER SPOTS - NOVEMBER 1994

TNX: W8TN - AB6ZV - N4KG - AA6TT- KD7SO - K1ZM - K9FD - KC7V - WAØGFS - WØZV - KYØA - K3ND - K4CEF KØHA - W1WAI - WW1O - NI6T - W1WAI - WB9Z - NXØI - K6SSS - WB9GYU - W6RJ - NI6T - K8GG - WAØPUJ - KØIJL

80 METERS

3791.0	A61AD	15-Nov-1994 0232Z
3799.4	A92BE	15-Nov-1994 0231Z
3789.5	FR5DX	15-Nov-1994 0211Z
3794.7	AP2UR	15-Nov-1994 0209Z
3509.0	TU2MA	15-Nov-1994 0128Z
3512.8	LZ1VA	14-Nov-1994 2342Z
3795.0	5T5BN	14-Nov-1994 2344Z
3505.0	UX1BZ	14-Nov-1994 2336Z
3507.0	Z31GB	14-Nov-1994 2305Z
3506.6	UT2EA	14-Nov-1994 2240Z
3789.0	9K2MU	14-Nov-1994 2231Z
3792.0	RW0LL	14-Nov-1994 1500Z
3796.0	HL3QBS	14-Nov-1994 1450Z
3799.0	HL2DNN	14-Nov-1994 1442Z
3799.0	XX9AS	14-Nov-1994 1420Z
3510.8	UA0LEC	14-Nov-1994 1416Z
3793.9	HL2DNN	14-Nov-1994 1257Z
3800.0	V63AO	14-Nov-1994 1232Z
3794.0	BV2FI	14-Nov-1994 1224Z
3799.0	SV5TS	14-Nov-1994 0520Z
3513.0	A22MN	14-Nov-1994 0332Z
3506.1	3DA0BK	14-Nov-1994 0308Z
3511.8	7P8SR	14-Nov-1994 0310Z
3513.0	VQ9QM	13-Nov-1994 2217Z
3760.0	V85AA	13-Nov-1994 1422Z
3797.8	BV2FI	13-Nov-1994 1227Z
3506.0	3B8CF	13-Nov-1994 0141Z
3796.9	A61AD	13-Nov-1994 0138Z
3788.4	EW1WZ	13-Nov-1994 0019Z
3793.0	5N0MVE	12-Nov-1994 2227Z
3790.0	BV2FI	12-Nov-1994 1409Z
3511.0	T91EVC	12-Nov-1994 0419Z
3504.7	5Z4FO	12-Nov-1994 0327Z
3511.0	7P8SR	12-Nov-1994 0318Z
3799.0	SV5TS	10-Nov-1994 0435Z
3790.0	FR5DX	10-Nov-1994 0135Z
3796.9	EX0V	8-Nov-1994 1211Z
3508.3	UY5BA	6-Nov-1994 0050Z
3503.0	VR2/K4UEE	5-Nov-1994 1448Z
3512.0	JD1/JI7BCD	5-Nov-1994 1357Z
3798.0	XX9AW	5-Nov-1994 1332Z
3797.3	XX9AS	4-Nov-1994 1406Z
3698.6	EX0V	4-Nov-1994 1227Z
3792.0	XX9AS	3-Nov-1994 1454Z
3795.0	XX9AS	2-Nov-1994 1448Z

40 METERS

7001.0	YKØA	24-Nov-1994 0234Z
7004.0	VR2GO	24-Nov-1994 1451Z
7004.0	XU7VK	24-Nov-1994 1450Z
7003.0	HL9DC	24-Nov-1994 1444Z
7005.8	9M8X	24-Nov-1994 1404Z
7008.0	JI7BCD/JD1	24-Nov-1994 1363Z
7006.4	HL9DC	24-Nov-1994 1352Z
7003.0	UT2QT	24-Nov-1994 1347Z
7007.7	VK9LY	21-Nov-1994 1215Z
7002.1	3V8BB	21-Nov-1994 0623Z
7009.5	3B8/F6HWU	21-Nov-1994 0147Z
7001.0	PY0FF	21-Nov-1994 0012Z
7002.7	3V8BB	20-Nov-1994 2329Z
7002.0	PY0FF	20-Nov-1994 0346Z
7009.2	RV0AM	20-Nov-1994 0120Z
7003.8	9K2ZZ	19-Nov-1994 1407Z
7007.8	3B8FQ	19-Nov-1994 1358Z
7006.7	VU2MTT	19-Nov-1994 1243Z
7004.0	ES4MM	19-Nov-1994 1230Z
7007.1	UK8AX	19-Nov-1994 1201Z
7006.3	PZ1DY	19-Nov-1994 0342Z
7047.0	C31RA	19-Nov-1994 0334Z
7005.6	UX07D	19-Nov-1994 0237Z
7015.2	6W6JX	19-Nov-1994 0205Z
7004.8	D2XX	19-Nov-1994 0009Z
7012.3	Z32ZM	19-Nov-1994 0008Z
7011.6	T94XU	19-Nov-1994 0005Z
7028.7	LX1LS	18-Nov-1994 2251Z
7000.9	9X5EE	18-Nov-1994 2230Z
7021.0	VU2TES	18-Nov-1994 2135Z

40 METERS

7021.0	VU2TES	18-Nov-1994 2135Z
7005.0	OK1AOQ	18-Nov-1994 2141Z
7015.5	J80C	18-Nov-1994 2136Z
7000.8	9X5EE	18-Nov-1994 2110Z
7067.0	RX3RY	18-Nov-1994 2001Z
7053.4	9A1CCJ	18-Nov-1994 1955Z
7068.4	US4LHG	18-Nov-1994 1948Z
7002.7	HZ1AB	18-Nov-1994 1254Z
7001.4	V63MN	18-Nov-1994 1205Z
7005.1	RZ4WWB	18-Nov-1994 1157Z
7087.6	RW9UZZ	18-Nov-1994 1155Z
7006.9	HK1AMW	18-Nov-1994 1152Z
7001.7	V63MN	18-Nov-1994 1134Z
7010.0	VK9LY	18-Nov-1994 1120Z
7016.7	FK8FU	18-Nov-1994 0959Z
7004.1	D2XX	18-Nov-1994 0448Z
7009.9	ZS1ADD	18-Nov-1994 0302Z
7060.0	P40J	18-Nov-1994 0302Z
7013.0	UR5MDW	18-Nov-1994 0239Z
7003.8	ZP6CW	18-Nov-1994 0218Z
7007.0	UR4WWT	18-Nov-1994 0202Z
7017.9	UR5IEH	18-Nov-1994 0146Z
7018.0	PJ7/W4BRE	18-Nov-1994 0136Z
7015.0	FY5FY	18-Nov-1994 0134Z
7013.2	OK3PKJ	18-Nov-1994 0137Z
7003.8	ZP6CW	18-Nov-1994 0133Z
7006.3	OX3KV	18-Nov-1994 0122Z
7008.8	Z32XA	18-Nov-1994 0134Z
7007.0	UR4WWT	18-Nov-1994 0103Z
7017.4	UR5IEH	18-Nov-1994 0050Z
7005.2	EW1MM	18-Nov-1994 0049Z
7004.8	3A2GL	18-Nov-1994 0040Z
7009.8	PY6AN	18-Nov-1994 0040Z
7003.0	9K2MU	18-Nov-1994 0035Z
7002.5	ZP6CW	18-Nov-1994 0019Z
7001.0	4Z4DX	18-Nov-1994 0006Z
7010.0	ZD8KJ	18-Nov-1994 0003Z
7013.7	CU2BJ	17-Nov-1994 2344Z
7003.9	RA3DUU	17-Nov-1994 2341Z
7011.2	UR4WWT	17-Nov-1994 2329Z
7012.4	FG/F6EPY	17-Nov-1994 2327Z
7009.2	HA4XW	17-Nov-1994 2333Z
7006.9	J28BS	17-Nov-1994 2232Z
7017.0	5U7Y	17-Nov-1994 2219Z
7006.4	JW0I	17-Nov-1994 2205Z
7001.7	9K2ZZ	17-Nov-1994 2204Z
7001.2	9X5EE	17-Nov-1994 2203Z
7013.7	V63MN	17-Nov-1994 1227Z
7010.0	NH2G	17-Nov-1994 1223Z
7005.2	UN8LW	17-Nov-1994 1204Z
7010.0	NH2G	17-Nov-1994 1121Z
7009.5	V63MN	17-Nov-1994 1111Z
7005.1	VK9LY	17-Nov-1994 1048Z
7010.4	V63MN	17-Nov-1994 1037Z
7005.4	TM0P	17-Nov-1994 0837Z
7010.5	ZL1ATZ	17-Nov-1994 0624Z
7003.1	S53A	17-Nov-1994 0552Z
7003.9	EA6NB	17-Nov-1994 0542Z
7015.0	FO5OU	17-Nov-1994 0438Z
7015.0	TR8XX	17-Nov-1994 0434Z
7002.2	XE1/AA6RX	17-Nov-1994 0416Z
7006.0	TO0P	17-Nov-1994 0409Z
7003.7	7P8SR	17-Nov-1994 0339Z
7011.0	FY5GJ	17-Nov-1994 0326Z
7007.6	TO0PU	17-Nov-1994 0335Z
7011.9	FG5FZ	17-Nov-1994 0257Z
7005.7	FY5YE	17-Nov-1994 0253Z
7003.6	7P8SR	17-Nov-1994 0253Z
7004.6	5R8DS	17-Nov-1994 0236Z
7012.5	ZA1J	17-Nov-1994 0216Z
7007.5	TO0P	17-Nov-1994 0215Z
7010.3	5B4OG	17-Nov-1994 0148Z
7002.8	ZA1J	17-Nov-1994 0134Z
7003.4	LZ1YQ	17-Nov-1994 0112Z
7002.6	UA1ZO	17-Nov-1994 0111Z
7005.3	EA8CN	17-Nov-1994 0052Z
7003.2	UA1ZO	17-Nov-199480054Z
7008.8	EA6BD	17-Nov-1994 0003Z

40 METERS

7001.1	5R8DP	16-Nov-1994 2322Z
7011.0	US9QA	16-Nov-1994 2225Z
7075.0	N7RK/ZB2	16-Nov-1994 2143Z
7001.1	VG2MCZ	16-Nov-1994 2139Z
7008.5	US7WW	16-Nov-1994 2134Z
7012.7	JW0I	16-Nov-1994 2120Z
7001.0	VP2MCZ	16-Nov-1994 2121Z
7012.7	JW0I	16-Nov-1994 2120Z
7001.0	VP2MCZ	16-Nov-1994 2121Z
7003.8	9X5EE	16-Nov-1994 2114Z
7002.0	CO2PL	16-Nov-1994 1246Z
7009.9	VK6XA	16-Nov-1994 1235Z
7003.1	TO0P	16-Nov-1994 1202Z
7004.2	CO2JD	16-Nov-1994 1136Z
7011.1	AA5DX/KP4	16-Nov-1994 1133Z
7006.6	EX8F	16-Nov-1994 1128Z
7004.7	VK3XU	16-Nov-1994 1126Z
7003.0	TO0P	16-Nov-1994 1118Z
7005.2	ZL1BVB	16-Nov-1994 1052Z
7004.2	HL5CL	16-Nov-1994 1051Z
7023.0	6Y5KF	16-Nov-1994 1045Z
7015.0	TR8XX	16-Nov-1994 0505Z
7015.0	ZS1WQ	16-Nov-1994 0430Z
7001.2	PY7ZZ	16-Nov-1994 0305Z
7008.5	XE1CCB	16-Nov-1994 0301Z
7003.6	XE1/AA6RX	16-Nov-1994 0254Z
7005.7	VG2MCZ	16-Nov-1994 0255Z
7010.9	7P8SR	16-Nov-1994 0302Z
7008.6	S53A	16-Nov-1994 0246Z
7008.6	S53A	16-Nov-1994 0246Z
7002.5	5R8DP	16-Nov-1994 0138Z
7002.5	5R8DP	16-Nov-1994 0147Z
7004.1	TO0P	16-Nov-1994 0138Z
7007.1	UR4WWT	16-Nov-1994 0129Z
7001.9	IS0OMH	16-Nov-1994 0125Z
7028.5	ZP6CW	16-Nov-1994 0121Z
7005.0	C6AFV	16-Nov-1994 0112Z
7013.4	CU2BJ	16-Nov-1994 0050Z
7005.9	S53A	16-Nov-1994 0042Z
7047.0	XE3AAF	16-Nov-1994 0039Z
7000.7	J28BS	16-Nov-1994 0048Z
7047.0	XE3AA	16-Nov-1994 0037Z
7006.7	T92A	16-Nov-1994 0039Z
7011.3	HC5AI	16-Nov-1994 0038Z
7053.0	HJ6SQQ	16-Nov-1994 0028Z
7042.9	9G1MR	16-Nov-1994 0026Z
7002.0	J28BS	16-Nov-1994 0021Z
7001.2	ZP6CW	15-Nov-1994 2344Z
7019.0	ZS5DJ	15-Nov-1994 2335Z
7017.0	ZP1KO	15-Nov-1994 2334Z
7005.6	9A3NC	15-Nov-1994 2250Z
7010.4	EW2CR	15-Nov-1994 2241Z
7002.3	T92A	15-Nov-1994 2128Z
7074.6	3X0DEX/TU	15-Nov-1994 2126Z
7007.0	ZA/PA0GAM	15-Nov-1994 2028Z
7001.4	NH2G	15-Nov-1994 2027Z
7083.0	A61AD	15-Nov-1994 2023Z
7004.8	EU1DX	15-Nov-1994 1322Z
7006.3	UN9LO	15-Nov-1994 1149Z
7003.1	RW1ZZ	15-Nov-1994 1140Z
7055.1	A22MN	15-Nov-1994 0417Z
7003.1	SV2BXJ	15-Nov-1994 0421Z
7004.3	5R8DP	15-Nov-1994 0333Z
7007.9	SV2BXJ	15-Nov-1994 0326Z
7054.9	SV3AQR	15-Nov-1994 0242Z
7061.1	DK3LQ/6W1	15-Nov-1994 0230Z
7006.4	Z32XA	15-Nov-1994 0112Z
7009.8	9H1DV	15-Nov-1994 0034Z
7001.0	J28BS	14-Nov-1994 2336Z
7012.1	5X1XT	14-Nov-1994 2158Z
7003.6	5R8DP	14-Nov-1994 0042Z
7007.1	UU0JM	14-Nov-1994 0028Z
7004.9	UA1ZO	13-Nov-1994 2254Z
7006.5	Z31CZ	13-Nov-1994 2252Z
7002.9	HS7ECI	13-Nov-1994 1558Z
7003.9	I1PZ	13-Nov-1994 1541Z
7004.8	DL3OI	13-Nov-1994 1533Z
7003.0	5R8DP	13-Nov-1994 1529Z

LOW BAND MONITOR POWER SPOTS - NOVEMBER 1994

TNX: W8TN - AB6ZV - N4KG - AA6TT- KD7SO - K1ZM - K9FD - KC7V - WA0GFS - W0ZV - KY0A - K3ND - K4CEF
K0HA - W1WAI - WW1O - NI6T - W1WAI - WB9Z - NX0I - K6SSS - WB9GYU - W6RJ - NI6T - K8GG - WA0PUJ - K0IJL

160 METERS

1908.0	JH0BBE	24-Nov-1994	1341Z
1909.0	JA7OEM	24-Nov-1994	1340Z
1910.0	JH2FXK	24-Nov-1994	1336Z
1908.0	JF1NZW	24-Nov-1994	1316Z
1907.0	JA1SQT	24-Nov-1994	1253Z
1833.0	HK6KKK	24-Nov-1994	0531Z
1836.0	WN4KKN/HC8	24-Nov-1994	0440Z
1835.0	PY0FF	24-Nov-1994	0053Z
1824.0	5W1MM	22-Nov-1994	1313Z
1840.0	EA3JE	21-Nov-1994	0724Z
1843.0	ZL2JR	21-Nov-1994	0723Z
1833.0	IV3PRK	21-Nov-1994	0619Z
1846.0	I3MAU	21-Nov-1994	0615Z
1832.0	CO1RH	21-Nov-1994	0549Z
1833.0	OE5NNN	21-Nov-1994	0544Z
1832.2	VP5/K8MFO	21-Nov-1994	0529Z
1835.6	F5IN	21-Nov-1994	0502Z
1832.3	IV3PRK	21-Nov-1994	0457Z
1836.3	OZ8ABE	21-Nov-1994	0441Z
1831.0	HA7PF	21-Nov-1994	0403Z
1830.2	OK1DOT	21-Nov-1994	0356Z
1831.4	VP5/K8MFO	21-Nov-1994	0311Z
1826.2	V47WZ	21-Nov-1994	0257Z
1835.6	UR0MC	21-Nov-1994	0238Z
1826.0	V47WZ	21-Nov-1994	0217Z
1834.6	PA0HIP	21-Nov-1994	0154Z
1835.0	PY0FF	21-Nov-1994	0054Z
1831.6	G4GKT	20-Nov-1994	2314Z
1825.9	SM3BDZ	20-Nov-1994	2312Z
1833.8	F5IN	20-Nov-1994	2212Z
1826.0	SM4HCM	20-Nov-1994	2205Z
1841.0	DJ6QT/6Y5	20-Nov-1994	0337Z
1840.0	4L4KK	20-Nov-1994	0315Z
1828.1	DL1IAO/A	19-Nov-1994	2259Z
1835.6	6W6JX	19-Nov-1994	2314Z
1910.0	JA3ONB	19-Nov-1994	2148Z
1907.8	JH1RES	19-Nov-1994	1221Z
1909.0	JA1HQT	19-Nov-1994	1207Z
1829.5	VK6HD	19-Nov-1994	1113Z
1833.0	CT1AOZ	19-Nov-1994	0704Z
1834.1	EA3VY	19-Nov-1994	0649Z
1829.4	FM5BH	19-Nov-1994	0612Z
1833.3	DK7SU	19-Nov-1994	0608Z
1825.0	G3PQA	19-Nov-1994	0607Z
1828.0	TI4CF	19-Nov-1994	0516Z
1830.0	IT9ZGY	19-Nov-1994	0502Z
1841.0	EA8PP	19-Nov-1994	0459Z
1834.9	OE5BMG	19-Nov-1994	0458Z
1832.0	OK1DOT	19-Nov-1994	0454Z
1829.2	SM5EDX	19-Nov-1994	0453Z
1840.0	EA8PP	19-Nov-1994	0439Z
1831.1	FM5BH	19-Nov-1994	0413Z
1835.8	RA6AHA	19-Nov-1994	0408Z
1829.9	F6AVR	19-Nov-1994	0355Z
1828.1	VP2VI	19-Nov-1994	0339Z
1828.1	S59A	19-Nov-1994	0345Z
1832.2	PT7AQ	19-Nov-1994	0338Z
1832.0	OM3LA	19-Nov-1994	0328Z
1823.9	OM5XX	19-Nov-1994	0331Z
1826.8	GM3POI	19-Nov-1994	0328Z
1829.1	SM5EDC	19-Nov-1994	0325Z
1832.0	PT7AQ	19-Nov-1994	0314Z
1829.1	SM5EDX	19-Nov-1994	0151Z
1836.0	S92SS	19-Nov-1994	0115Z
1830.5	RZ6HW	19-Nov-1994	0102Z
1831.8	ZB2FK	19-Nov-1994	0057Z
1829.2	ZA1AJ	19-Nov-1994	0036Z
1829.8	UA0ACG	19-Nov-1994	0029Z
1832.5	9K2ZZ	19-Nov-1994	0018Z
1827.5	T93M	18-Nov-1994	2337Z
1837.8	OZ1BTE	18-Nov-1994	2334Z
1830.0	4X4NJ	18-Nov-1994	2329Z
1841.0	EA3JE	18-Nov-1994	2328Z
1832.6	PA0HIP	18-Nov-1994	2308Z
1828.0	SM5AQD	18-Nov-1994	2305Z
1833.0	SV8ZS	18-Nov-1994	2256Z
1827.5	9A2M	18-Nov-1994	2251Z
1835.8	S92SS	18-Nov-1994	2244Z

160 METERS

1831.0	OH1TN	16-Nov-1994	2358Z
1831.7	SP5GRM	16-Nov-1994	2318Z
1833.0	DL7HU	16-Nov-1994	2303Z
1829.6	SP5GRM	16-Nov-1994	2149Z
1826.0	SM4HCM	16-Nov-1994	2147Z
1908.0	UX0ZZ	16-Nov-1994	2130Z
1830.5	SP5GRN	16-Nov-1994	2121Z
1828.0	OH1XX	16-Nov-1994	2119Z
1907.8	JA1HQT	16-Nov-1994	1216Z
1832.9	OZ3SDL	16-Nov-1994	0636Z
1827.0	DF3OL	16-Nov-1994	0610Z
1827.9	OE5NNN	16-Nov-1994	0610Z
1833.8	F6FGZ	16-Nov-1994	0602Z
1830.7	KH6CC	16-Nov-1994	0554Z
1830.7	DL5NWW	16-Nov-1994	0550Z
1832.2	P40J	16-Nov-1994	0536Z
1831.2	KH6CC	16-Nov-1994	0536Z
1831.0	F5IN	16-Nov-1994	0521Z
1833.3	LA5SAA	16-Nov-1994	0409Z
1829.0	OK1DOT	16-Nov-1994	0408Z
1824.0	CO6CG	16-Nov-1994	0358Z
1829.0	GM3POI	16-Nov-1994	0342Z
1827.2	A22MN	16-Nov-1994	0307Z
1833.6	SP5EWY	16-Nov-1994	0257Z
1829.5	VP9MZ	16-Nov-1994	0233Z
1833.6	SP5EW	16-Nov-1994	0223Z
1830.9	EA3JJ	16-Nov-1994	0209Z
1834.8	PA0HIP	16-Nov-1994	0211Z
1830.0	KG4JO	16-Nov-1994	0207Z
1832.7	UA9SAB	16-Nov-1994	0159Z
1830.7	G3YRO	16-Nov-1994	0156Z
1834.9	PA0HIP	16-Nov-1994	0141Z
1827.0	J6/DL3KDV	16-Nov-1994	0137Z
1828.8	DK1NO/A	16-Nov-1994	0132Z
1830.5	PY2DP	16-Nov-1994	0114Z
1826.9	HK7/SM5HV	16-Nov-1994	0113Z
1830.0	SP2ERG	16-Nov-1994	0018Z
1831.3	RV1CC	15-Nov-1994	2356Z
1831.8	FM5BH	15-Nov-1994	2317Z
1830.0	G3RPB	15-Nov-1994	2300Z
1831.2	UA9XFY	15-Nov-1994	2251Z
1827.0	4N7ZZ	15-Nov-1994	2119Z
1835.6	SM7AHN	15-Nov-1994	2115Z
1834.9	SV8ZS	15-Nov-1994	2114Z
1834.1	F5IN	15-Nov-1994	2109Z
1832.7	EA3JE	15-Nov-1994	2106Z
1907.8	JA1HQT	15-Nov-1994	1215Z
1908.3	JA1CGM	15-Nov-1994	1212Z
1828.7	OK1DQT	15-Nov-1994	0537Z
1845.0	DL6KR	15-Nov-1994	0456Z
1829.2	I2YSB	15-Nov-1994	0453Z
1834.8	F5IN	15-Nov-1994	0528Z
1824.5	S59AA	15-Nov-1994	0525Z
1833.2	DK7SU	15-Nov-1994	0447Z
1835.7	SP5EWY	15-Nov-1994	0446Z
1824.5	S59AA	15-Nov-1994	0524Z
1830.1	OK1DOT	15-Nov-1994	0444Z
1831.3	UA3AB	15-Nov-1994	0443Z
1832.0	OM2XW	15-Nov-1994	0441Z
1833.7	HA7PF	15-Nov-1994	0426Z
1827.0	A22MN	15-Nov-1994	0313Z
1826.0	4N7ZZ	14-Nov-1994	2349Z
1806.3	UA5CO	14-Nov-1994	2320Z
1829.7	A71CW	14-Nov-1994	2259Z
1826.7	4N7ZZ	14-Nov-1994	2143Z
1829.7	OY3QN	14-Nov-1994	2118Z
1829.0	ZD7XY	13-Nov-1994	2124Z
1808.0	YO4PX	13-Nov-1994	1439Z
1834.0	SV8ZS	13-Nov-1994	0524Z
1836.0	UA2FF	13-Nov-1994	0044Z
1833.0	SV2BDC	12-Nov-1994	2211Z
1911.0	ES5MC	12-Nov-1994	2132Z
1835.3	UT3IQ	12-Nov-1994	2124Z
1828.9	OM5NU	11-Nov-1994	0522Z
1826.0	YL2PQ	11-Nov-1994	0503Z
1837.0	UR8UN	10-Nov-1994	0446Z
1829.6	YO8KOS	6-Nov-1994	0223Z
1835.4	UR0EQ	3-Nov-1994	0231Z

80 METERS

3801.0	7M1RYI	24-Nov-1994	1400Z
3504.0	RA0JD	24-Nov-1994	1337Z
3795.5	RW0LL	24-Nov-1994	1332Z
3799.0	V63AO	24-Nov-1994	1308Z
3788.7	ZL2SQ	24-Nov-1994	0702Z
3791.0	OZ1BTE	24-Nov-1994	0653Z
3800.0	OE6MBG	24-Nov-1994	0617Z
3506.8	T32BE	21-Nov-1994	1317Z
3514.2	SV2AVP	21-Nov-1994	0516Z
3792.0	S52CD	21-Nov-1994	0349Z
3799.0	YU70F	21-Nov-1994	0341Z
3794.5	4L4KK	19-Nov-1994	2323Z
3790.0	9G1MR	19-Nov-1994	2309Z
3799.0	OH7UE	19-Nov-1994	1310Z
3799.0	OH1TX	19-Nov-1994	1309Z
3508.0	JI7BCD/JD1	19-Nov-1994	1237Z
3799.2	EX0V	19-Nov-1994	1216Z
3502.9	V63MN	19-Nov-1994	1205Z
3503.0	TF3DX	19-Nov-1994	1130Z
3796.4	C31HK	19-Nov-1994	0704Z
3799.3	CT3FF	19-Nov-1994	0612Z
3786.8	SV5TS	19-Nov-1994	0519Z
3506.2	D2XX	19-Nov-1994	0331Z
3503.9	ZS6QU	19-Nov-1994	0333Z
3789.9	S58FA	19-Nov-1994	0318Z
3507.1	5X1XT	19-Nov-1994	0320Z
3786.0	C31RA	19-Nov-1994	0307Z
3500.7	EU7SA	19-Nov-1994	0245Z
3799.8	T91A	19-Nov-1994	0232Z
3799.6	ZA1AJ	19-Nov-1994	0013Z
3790.5	OS4GG	18-Nov-1994	2353Z
3789.0	7X2LS	18-Nov-1994	2254Z
3508.0	EU3FT	18-Nov-1994	2249Z
3507.0	TA2AI	18-Nov-1994	2255Z
3789.0	9G1MR	18-Nov-1994	2209Z
3506.0	V63MN	18-Nov-1994	1222Z
3796.0	EX0V	18-Nov-1994	1143Z
3506.0	V73C	18-Nov-1994	1101Z
3502.3	LY2WW	18-Nov-1994	0543Z
3789.6	SV1AOZ	18-Nov-1994	0540Z
3505.8	GJ2FMV	18-Nov-1994	0508Z
3503.0	HB0/HB9BFN	18-Nov-1994	0451Z
3799.0	Z31PK	18-Nov-1994	0445Z
3503.0	UR7GR	18-Nov-1994	0421Z
3504.9	OM5XX	18-Nov-1994	0349Z
3516.4	UR4CW	18-Nov-1994	0345Z
3512.1	5X1XT	18-Nov-1994	0338Z
3511.4	A22MN	18-Nov-1994	0312Z
3502.8	UR6IM	18-Nov-1994	0309Z
3502.8	6Y5AL	18-Nov-1994	0307Z
3505.0	EU7SA	18-Nov-1994	0305Z
3799.1	OM5DX	17-Nov-1994	2346Z
3507.1	EW1WZ	17-Nov-1994	2337Z
3794.1	T5AR	17-Nov-1994	2258Z
3803.0	5W1MM	17-Nov-1994	1120Z
3800.0	8R1AK	17-Nov-1994	1008Z
3507.9	UR7FF	17-Nov-1994	0524Z
3512.3	A22MN	17-Nov-1994	0344Z
3504.5	T91DNO	17-Nov-1994	0044Z
3789.0	TA2DS	16-Nov-1994	2255Z
3502.8	YL1XX	16-Nov-1994	2224Z
3505.0	DU1KK	16-Nov-1994	1255Z
3803.0	5W1MM	16-Nov-1994	1102Z
3796.0	TF3TF	16-Nov-1994	0950Z
3796.0	TF3BM	16-Nov-1994	0948Z
3514.1	9J2BO	16-Nov-1994	0412Z
3511.1	A22MN	16-Nov-1994	0402Z
3505.0	5X1XT	16-Nov-1994	0354Z
3507.0	3DA0BK	16-Nov-1994	0306Z
3505.0	ZP6CW	16-Nov-1994	0142Z
3506.9	UR0CX	16-Nov-1994	0035Z
3789.0	3A2LU	16-Nov-1994	0001Z
3972.0	C31SD	15-Nov-1994	2347Z
3797.2	5T5BN	15-Nov-1994	2344Z
3513.5	ER1CW	15-Nov-1994	0437Z
3780.6	8R1AK	15-Nov-1994	0356Z
3512.1	A22MN	15-Nov-1994	0326Z
3794.8	LZ2LH	15-Nov-1994	0230Z